

CLAIMS

1. A functional member, comprising:
  - a flexible base material,
  - a first layer which is formed on the base material and comprises a dry matter of a mixture comprising an inorganic porous material and an organic emulsion, and
  - a second layer comprising an inorganic filler which is fixed over an approximately entire surface of the first layer by an organic binder,wherein the organic matter in the organic emulsion has a glass-transition temperature of  $-5^{\circ}\text{C}$  to  $-50^{\circ}\text{C}$ ; and  
wherein the organic binder in the second layer is contained in an amount of 30-300 parts by volume to 100 parts by volume of the inorganic filler.
2. The functional member according to claim 1, wherein the second layer has a coat thickness of 1 to 100  $\mu\text{m}$ .
3. The functional member according to claim 1 or 2, wherein the inorganic filler has a particle size of equal to or less than 60  $\mu\text{m}$ .
4. The functional member according to any one of claims 1 to 3, wherein the inorganic filler comprises at least one of the titanium oxide and calcium carbonate.
5. The functional member according to any one of claims 1 to 4, wherein the organic binder is a cured matter of the organic emulsion.
6. The functional member according to claim 5, wherein the glass-transition temperature of the organic matter in the organic emulsion for the second layer is  $-10^{\circ}\text{C}$  to  $30^{\circ}\text{C}$ .
7. The functional member according to any one of claims 1 to 6, further comprising a designed layer formed on a surface of the second layer.
8. The functional member according to any one of claims 1 to 7, further comprising a water repellent layer formed on a surface of the second layer or on a surface of the designed layer.

9. The functional member according to any one of claims 1 to 8, wherein the second layer further comprises at least one of a germicide and a fungicide.

10. The functional member according to claim 8 or 9, wherein the water repellent layer further comprises at least one of a germicide and a fungicide.

11. The functional member according to any one of claims 1 to 10, wherein the second layer further comprises a photocatalyst.

12. The functional member according to any one of claims 8 to 11, wherein the water repellent layer further comprises a photocatalyst.

13. The functional member according to any one of claims 1 to 12, wherein the second layer further comprises a water repellent additive.

14. The functional member according to any one of claims 1 to 13, having a volume of a fine pore of which a diameter is 4-14 nm measured by nitrogen gas adsorption of the inorganic porous material being equal to or more than 0.1 ml/g; and a total volume of all the fine pores of which each diameter is 1-200 nm measured by nitrogen gas adsorption of the inorganic porous material being equal to or less than 1.5 ml/g.

15. The functional member according to any one of claims 1 to 14, wherein the first layer comprises 200 to 500 parts by weight of the inorganic porous material to 100 parts by weight of a dry matter in the organic emulsion.

16. The functional member according to any one of claims 5 to 15, wherein the organic emulsion for the first layer has a dry weight of equal to or less than 100 g/m<sup>2</sup>; the organic emulsion for the second layer has a dry weight of equal to or less than 50 g/m<sup>2</sup>; and the functional member has a weight of all organic matters including the base material of equal to or less than 300 g/m<sup>2</sup>.

17. The functional member according to any one of claims 1 to 16, wherein the first layer further comprises a water

soluble fungicide.

18. The functional member according to any one of claims 1 to 17, wherein the first layer comprises 400 to 1200 parts by volume of the inorganic porous material to 100 parts by volume of the dry matter in the organic emulsion.

19. The functional member according to claim 18, having a volume of a fine pore of which a diameter is 4-14 nm measured by nitrogen gas adsorption of the inorganic porous material being equal to or more than 0.2 ml/g; and a total volume of all the fine pores of which each diameter is 1-200 nm measured by nitrogen gas adsorption of the inorganic porous material being equal to or less than 1.3 ml/g.

20. The functional member according to any one of claims 1 to 17, wherein the first layer further comprises a non-porous filler.

21. The functional member according to claim 20, wherein the first layer comprises 400 to 1100 parts by volume of the inorganic porous material and 50 to 500 parts by volume of the non-porous filler to 100 parts by volume of the dry matter in the organic emulsion; and a total amount of the inorganic porous material and the non-porous filler is 400 to 1200 parts by volume.

22. The functional member according to claim 20 or 21, having a volume of a fine pore of which a diameter is 4-14 nm measured by nitrogen gas adsorption of the inorganic porous material being equal to or more than 0.4 ml/g; and a total volume of all the fine pores of which each diameter is 1-200 nm measured by nitrogen gas adsorption of the inorganic porous material being equal to or less than 1.6 ml/g.

23. The functional member according to any one of claims 7 to 22, further comprising a coating layer of a dry matter of a resin colloidal dispersion is formed on a surface of the designed layer.

24. The functional member according to any one of claims 1 to 23, further comprising a photocatalyst fixed on an outermost surface layer.

25. The functional member according to any one of claims 1 to 24, wherein the base material is selected from the group consisting of a paper, a synthetic resin sheet, a woven fabric, a non-woven fabric, a glass fiber sheet, a metal fiber, a flame-retardant backing paper, a base material paper for wall papers, a composite and a laminated material thereof.

26. An coating liquid for forming the first layer of the functional member according to claims 1 to 25, comprising an inorganic porous material and an organic emulsion, wherein the organic matter in the organic emulsion has a glass-transition temperature of  $-5^{\circ}\text{C}$  to  $-50^{\circ}\text{C}$ .

27. The coating liquid according to claim 26, further comprising a non-porous filler.

28. A method of manufacturing a functional member according to any one of claims 1 to 25, comprising the steps of:

providing a flexible base material,

applying the coating liquid according to claim 25 or 26 on the base material,

drying the coating liquid to form a first layer, and

applying a mixture of an inorganic filler and an organic binder over an approximately entire surface of the first layer to form a second layer,

wherein the organic binder in the second layer is contained in an amount of 30-300 parts by volume to 100 parts by volume of the inorganic filler.